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AUTHOR Gavelek, James R.; Raphael, Taffy E.; Biondo, Sandra M.; Wang, Danhua

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ABSTRACT

Integrated instruction may be everyone's ideal, but it is the reality in few classrooms. This review of existing literature examines research to determine why this ideal may be infrequently realized. The review concluded that the mismatch between ideal and practice may be at least partially explained by the ambiguity in definitions in the professional literature. Finding no theoretical framework on which to base the review, the first task of the reviewers was to develop one. Next, the reviewers applied this framework to existing research on integrated instruction in elementary grades. They found few data-driven studies on integrated instruction of any sort, although essays advocating integrated language arts were many. Most projects interpreted integration as loose, thematic links. When studies considered interdisciplinary instruction, the boundaries between the subject areas were often rigid. Rarely would a literary stance or writing as a means for reflection be fostered across subject areas. While integrated approaches can serve to restructure school curriculum within and beyond the language arts, the paper concludes that a stronger theoretical and a research base is needed in establishing when and how to integrate the curriculum as well as for what purposes and for whom. Contains 108 references and a figure presenting a conceptual map of integration. (RS)

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CIERA REPORT

Integrated Literacy Instruction

A Review of the Literature

James R. Gavelek, Taffy E. Raphael, Sandra M. Biondo, and Danhua Wang
Oakland University

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CIERA Inquiry 2: Home and School
What is integrated literacy instruction, and how can it facilitate children's literacy learning? How can teachers be supported in their attempts to integrate curriculum within and beyond the language arts?

Integrated instruction may be everyone's ideal, but it is the reality in few classrooms. In this review of existing literature, Gavelek and his colleagues examined research to determine why this ideal may be infrequently realized.

Soon into the review, Gavelek et al. concluded that the mismatch between ideal and practice may be at least partially explained by the ambiguity in definitions in the professional literature. Finding no theoretical framework on which to base the review, the first task of the reviewers was to develop one. Next, Gavelek et al. applied this framework to existing research on integrated instruction in elementary grades. They found few data-driven studies on integrated instruction of any sort, although essays advocating integrated language arts were many. Most projects interpreted integration as loose, thematic links. When studies considered interdisciplinary instruction, the boundaries between the subject areas were often rigid. Rarely would a literary stance or writing as a means for reflection be fostered across subject areas.

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CIERA

Center for the Improvement of Early Reading Achievement
University of Michigan -- Ann Arbor

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Center for the Improvement of Early Reading Achievement

University of Michigan School of Education

610 E University Ave., Rm 1600 SEB
Ann Arbor, MI 48109-1259

734.647.6940 voice
734.763.1229 fax
ciera@umich.edu

www.ciera.org

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Integrated Literacy Instruction: A Review of the Literature

James R. Gavelek, Taffy E. Raphael, Sandra M. Biondo, and Danhua Wang
Oakland University

Deriving from Latin, *to integrate* means to make whole or renew. Definitions from the 1996 American Heritage dictionary include: (a) to join so as to form a larger more comprehensive entity; and (b) to blend, harmonize, synthesize, arrange, incorporate, unify, coordinate, and orchestrate. By its very definition, integration and integrated approaches to literacy instruction are extremely appealing. Further, integrated instruction has been thought to address three needs in education: authenticity, meaningfulness, and efficiency. Integrated instruction is more *authentic*, being parallel to real-world tasks, not those developed solely for schooling. Integrated instruction is more *meaningful*—knowledge or information is rarely needed to answer isolated questions. Rather, knowledge construction is an integrative process. Third, integrated instruction is *efficient*, offering hope for greater curriculum coverage. Integrated instruction may be everyone's ideal, but it is the reality in few classrooms. Our literature review convinced us that integrated literacy instruction is one of our field's most multifaceted and elusive constructs.[1]

Our report consists of four sections: (a) our process for generating the pool of writings for our review, (b) a brief historical treatment of integrated literacy instruction, (c) our analysis of the "state of research," and (d) a theoretical critique.

Identifying the Data Base

Assuming we could build on recent reviews, we began with three recent research handbooks (Barr, Kamil, Mosenthal, & Pearson, 1991; Flood, Jensen, Lapp, & Squire, 1991; Jackson, 1992). We found no chapters on integrated instruction, integrated curriculum, or integrated literacy instruction, though several explored relationships between specific language processes (e.g., reading/writing by Tierney & Shanahan, 1991; speaking/listening by Pinnell & Jaggar, 1991) or reviewed language and the language arts (Mar-

zano, 1991). Moreover, there were no index entries for integrated instruction in either the reading or language arts handbooks. When library searches (e.g., ERIC) of refereed journals between 1988 and 1998 revealed few entries for empirical studies on integration, we widened our "net" to include papers published from nonrefereed sources and did not restrict our time period. Bibliographic tracing led to writings from the late 1800s, though most studies were conducted in the 1980s and 1990s.

We met biweekly for five months to analyze the sources. Our first analysis focused on conceptually mapping what our field has meant by integrated literacy instruction and similar terms (e.g., integrated curriculum, interdisciplinary instruction). Our second, focused primarily on elementary grades (see Adler & Flihan, 1997, for a review of middle and high school research in this area), examined the research base for different types of integrated literacy instruction. To set a context, we begin historically.

A Brief History of Integrated Literacy Instruction

As Langer and Allington (1992) have discussed in detail, integrating school subjects was offered as a solution to various educational problems. For example, the National Education Association formed the Committee of Ten to examine students' college preparation. They determined that students were underprepared in language skills and suggested that "There can be no more appropriate moment for a brief lesson in expression than the moment when the pupil has something which he is trying to express" (National Education Association, 1984, p. 87, as cited in Langer & Allington, 1992, p. 690). Others were concerned about the educational experiences of young learners. Scholars (Cremin, 1964) associated with the Progressive Education Movement emphasized a child-centered curriculum. This movement decried the factorylike efficiency models underlying school structures, and feared that learning had little meaning for the average child and little resemblance to the real world. This philosophy laid the groundwork for interdisciplinary approaches.

> Our whole policy of compensatory education rises or falls with our ability to make school life an interesting and absorbing experience to the child. In one sense there is no such thing as compulsory education. We can have compulsory physical attendance at school; but education comes only through willing attention to and participation in school activities. It follows that the teacher must select these activities with reference to the child's interests, powers, and capabilities. In no other way can she guarantee that the child will be present. (Dewey, 1913, p. ix)

To date, the most ambitious study undertaken to examine these beliefs in practice was the Eight Year Study conducted in the 1930s in 30 high schools across the country. With the cooperation of 300 colleges and universities who agreed to waive traditional subject matter entrance examinations, the researchers were freed to develop a curriculum that focused on the personal and social needs of students. Courses were created that integrated across

disciplinary boundaries, emphasizing learning experiences that mirrored real-world events.

Scores from standardized college-level tests of 1,475 matched pairs of students revealed that, generally, students from the progressive high schools outperformed peers in traditional programs. Progressive classroom students also were more active in extra curricular activities, suggesting their broader educational goals. However, despite this evidence, the study had little effect on redesigning instructional goals or organizing today's classrooms.

More recent iterations reflect continued influence of principles for integrated instruction, reflected in the progressive education movement. For example, the British infant school movement was grounded on principles of student-centered learning that emphasized language and language arts as central to the study of school subjects. The open school movement (Holt, 1967; Silberman, 1970) emphasized inquiry-driven activity across disciplines as students pursued questions they found intriguing. One philosophical base of whole language is integration—emphasizing what is "whole" about language and the study of school subjects (Goodman, 1989). Perhaps most recently, the influence of integrated approaches is visible in some current reform efforts (e.g., Coalition of Essential Schools, 1988; Sizer, 1984).

While integrated approaches have a long history, those supporting them have not clearly delineated the construct. Integrated curricula are often based in life experiences, but it is not clear whether integrating experiences should be the basis for exploring curriculum content, or if the content itself should be presented as an integrated *fait accompli*. Across decades, our field has confounded these two orientations. Our first analysis focused on clarifying the construct.

Defining Integrated Instruction

In creating our conceptual map defining integrated literacy instruction, we noticed a lack of core citations and inconsistency in use of terms and definitions. Four decades ago, in his introduction to the *Yearbook of the National Society for the Study of Education* focused on integrated instruction, Dressel (1958a) wrote,

> In our day the term (integration) has come into such varied use as to be suspect...The real difficulty with the word "integration" rests in the multiplicity of interrelated meanings which permit its use in reference to many and differing situations but which may also result in ambiguity that interferes with a reasoned discussion. (p. 8)

Four decades later, little has changed. Shoemaker (1991, p. 793) suggests there exist "an equal number of terms to describe the various ways [integrated instruction] might be approached." Editors of a National Council of Teachers of English Committee book on integrating the language arts note that "integrated language arts learning takes many forms, some of which are controversial" (Busching & Schwartz, 1983, p. vii), but they neither critique nor define the term.

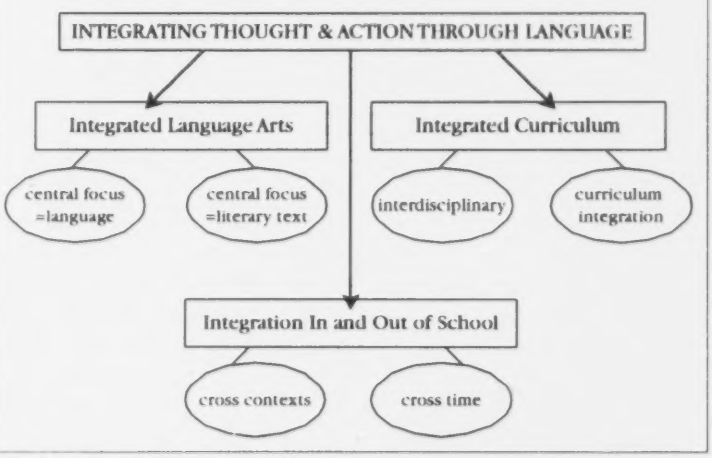
Some (e.g., Ellis & Fouts, 1993) equate terms such as interdisciplinary curriculum and integrated studies; others (e.g., Beane, 1995, 1997) distinguish between interdisciplinary and integrative curriculum. For some, "interdisciplinary" preserves disciplinary boundaries, while "integrated" does not. Both Kain (1993) and Beane (1995) suggest that interdisciplinary studies may repackage or enhance discipline-based knowledge, but they are not integrated. In contrast, Petrie (1992) used interdisciplinary to characterize a blending of disciplines, and multidisciplinary to maintain boundaries across disciplines. These are but a few examples of the diverse ways in which integrated instruction and related terms have been characterized.

In discussing whole language, Bergeron (1990, p. 321) argued for the importance of shared definitions when promoting alternatives to current practice. She suggested "a common terminology for those ideas we wish to share. ...Without a common terminology the differences between research and practice, and between innovation and instruction, will be difficult to reconcile." Integrated instruction reflects alternatives to current instructional practices within the language arts, as well as between language arts and school subjects (e.g., general science) or disciplines (e.g., biology). The absence of shared definitions severely limits the usefulness of integrated instruction as a generative construct.

A Conceptual Map of Integrated Instruction

For some researchers describing curriculum integration, the referent is the curriculum (i.e., the "what"), while for others it is the processes that support integration (i.e., the "how"). In the former, teachers present a curriculum that has been integrated; in the latter, they teach processes for integrating

Figure 1: A Conceptual Map of Integration



across school subjects. In 1958, Dressel echoed this distinction when he suggested a difference between *integrated curriculum* and *integrating experience*. Building from Dressel (1958a, 1958b) and other scholars' con-

ceptual schemes, we identified three categories that compose our conceptual map (see Figure 1): integrated language arts, integrated curriculum, and integration in and out of school. Each denotes integration toward some purpose.

Integrated Language Arts.

When the language arts are brought together to achieve some end(s), we call this "integrated language arts." Synonymous with *intradisciplinary* (Lipson et al., 1993), *coordinated* (Grisham, 1995), and *topics-within-disciplines* (Shoemaker, 1993), some combination of reading, writing, listening, speaking, and viewing are taught together as students pursue interesting problems or topics. This is not simply using one of the language arts to support another (as in teaching text structures through writing to help children's reading), but the coordinated instruction of some combination of the major language processes as tools to achieve a learning goal.[2]

Many have emphasized the importance of the interrelationship among the language arts. Morrow et al. (1997) argue that an integrated approach can help young children see that what they are learning in one domain can transfer to another. Walmsley and Walp (1990) suggest that written literacy can be a major vehicle for gaining access to, enlarging, and communicating knowledge. Wixson, Peter, and Potter (1996) characterize the base of intradisciplinary units as the issues, themes, and problems within literature and other oral, visual and written texts where students pursue important questions, enhancing the relevance of the language arts themselves. Within this category, the language processes may be applied directly to reading, interpreting, and responding to literature (e.g., a literary text, a collection of literature related by author or genre). Alternatively, language processes may be linked more generally to literary themes for understanding humanity (Galda, 1998), with instructional foci on developing students' understandings of these themes through activities grounded in using written and oral language and, more recently, viewing.

Integrated Curriculum.

An integrated curriculum highlights the integration of *content* by blending disciplines through "overlapping skills, concepts and attitudes" (Fogarty, 1991, p. 64). One position—interdisciplinary curriculum—emphasizes connection between language arts and content area learning (e.g., Grisham, 1995; Roehler, 1983), or problem-centered, thematic pursuits (e.g., Anders & Pritchard, 1993; Powell, 1995). From this perspective, language and literacy are "functional tools, rather than curricular entities to be studied or mastered in their own right" (Pearson, 1994, p. 19). In these definitions, the presence of more than one discipline or school subject as part of the curricular unit is central—if not core—to integration.

While associated with interdisciplinary approaches, Beane's (1993, 1997) view of curriculum integration fundamentally differs. Disciplines—especially as reflected in school subjects—represent what he calls the "hardening of the categories" (1997, p. 39). Placing curriculum integration within a collection of interdisciplinary approaches implies a continuum, where teachers moving from instruction in separate subject matters may first move toward connecting across disciplines, and later to integration. Instead, Beane suggests that disciplinary boundaries be downplayed, not approached in terms of how they can each contribute to a particular line of inquiry or a project. The integrative activities within the curriculum use knowledge without regard to the school subject area or discipline with which it is associated.

Integration In and Out of School.

A conceptualization of integrated instruction emphasizes learning across contexts (e.g., home, school, community, work). This category is orthogonal and complementary to the previous two since integration across language processes or school subjects may occur within and beyond the classroom.

Summary

Pearson (1994) highlights the linguistic link between "integrity" and "integration," and the irony that the notion of integrity is used to argue both for maintaining separation of the disciplines or school subjects and for promoting the integration of language processes, subject areas, disciplines, and disciplined inquiry. Definitions of integrated instruction leave open debate about what "counts" as integrated instruction. Is it sufficient to link more than one area of study? Can linked areas exist only within written literacy; within language and literacy; within language, literacy, and viewing; across language/literacy and disciplinary study? Must we see connections across units, or across grade levels and, hence, across classrooms and teachers? In the next section, we turn to our second analysis detailing the research base for integrating processes.

Integrated Instruction: The Research Base

In our review, we discovered that despite a large body of writing on curriculum organization, "little of it reports research, if one defines 'research' as seeking to demonstrate or describe a relationship between. . . some pattern of organization and such outcomes as the understanding of subject matter" (Goodlad & Su, 1992, p. 327). Referring to studies integrating social studies and literature, McGowan, Erickson and Neufeld (1996) concur:

> The number of convincing arguments for social studies instruction based on literary sources far outweighs the amount of published research documenting the extent to which literature-based teaching promotes the knowledge, skills and values that constitute civic competence. Evidence seems limited, inconclusive, and concentrated on how trade books enhance students' knowledge acquisition (p. 206).

Similarly, in describing integrated literacy instruction, Shanahan (1997) writes,

> (G)iven the long history and nearly universal acceptance of the idea of integration. . . there have been few empirical investigations of its effects. . . . I have been able to identify no study, in any field with any age level, that has clearly demonstrated more coherent or deeper understandings, or better applicability of learning as a result of integration. (p. 15)

In the sections below, we frame our review within the categories in Figure 1. We first examine studies of language arts integration, then research on integrated curricula with the focus across disciplines. We end with studies that focus on integration in and out of school.

Integrated Language Arts

Some studies (e.g., Morrow, 1992; Walmsley & Walp, 1990) provide conceptual arguments for integration and insights into challenges and potential benefits for teachers and students. Some provide images of what integrated language arts instruction looks like in classrooms and how such experiences impact students across grade and ability levels (e.g., Baumann & Ivey, 1997; Block, 1993; Goatley, Brock, & Raphael, 1995; Raphael, Brock, & Wallace, 1998). Others (e.g., Meyer, Youga, & Flint-Ferguson, 1990; VanTassel-Baska, Johnson, Hughes, & Boyce, 1996) show positive effects of what is purported to be an integrated approach, but lack details about the nature of the intervention, and descriptions of the outcome measures make it difficult to determine what was integrated.

As conveyed in Figure 1, studies of integrating the language arts tended to organize around either language processes or a literary selection. In the first instance, language processes are central; text selection tends to be incidental. Subject matter texts, a single literary text, or a text set related by theme or topic are chosen and used in the service of the language processes. The second form reverses figure and ground. Literary texts drive the language instruction emphasizing language processes derived from those texts.

Walmsley and Walp's (1990) study illustrates integrated language arts research that takes written language as its central focus. With third- and fourth-grade teachers, they identified themes to guide unit construction, literature selection, and to-be-taught skills. The integrated language arts period included a teacher read-aloud, reading and writing instruction, and opportunities for students to present reading and writing projects. However, they noted separate times and activities for reading and writing, and the activities emphasized were traditional ones (e.g., directed reading activities, sustained silent reading). While potentially integrative in focus, there was nothing inherent about the activities or organization to encourage integration. Assuming that teachers' guidance and framing questions underlying these units were integrative in nature, did this impact students' written language development? Since the authors note that their project was aimed at solving specific problems in the elementary language arts curriculum rather than proving superiority of a method, they are cautious in claiming effectiveness. They do show that, despite the challenges, data from vocabulary and comprehension subtest performance on a reading achievement test show students performed at or above grade level. Further, a measure of the number of books from sustained silent reading for which students held conferences with their teacher reveals a substantial amount read at each grade level. However, we cannot know whether these measures would reflect differences had students been in a traditional program; nor is the form and nature of the integration students experienced clear from the description.

Morrow (1992) builds on Walmsley and Walp's (1990) study, focusing directly on impact as she studied the effects of supplementing an existing basal reading program with literature in two second-grade classrooms. While not explicitly defining her intervention as an integrated language arts approach, the program shared many of those features: (a) emphasizing written and oral language processes in response to literature; (b) embedding skill-oriented literacy learning within literature reading; and (c) identifying key outcomes including comprehension, ability to create both oral and written stories, development of language complexity, vocabulary, and positive dispositions toward literacy and literature. When compared to similar children with neither literacy centers nor a literature emphasis, these children outperformed their control-group peers on virtually all measures. Students in the intervention group read more, had higher scores in story retellings, had higher comprehension scores, and created more original stories than did students in the control group, all with no cost to their performance on standardized tests.

Morrow's well-designed and carefully controlled experimental approach provided sufficient description of both the intervention and students' engagement to interpret findings. The study built a persuasive case for the value of, at the very least, systematically supplementing traditional commercial programs with literature. While it would be easy to criticize the study for not clarifying "integrative" thinking results from such activity, it is important to remember that the study did not purport to be a model of integrated instruction.

In contrast, VanTassel-Baska and her colleagues (1996) purported to be investigating a model of integrated teaching, interweaving language processes. The researchers examined the impact on gifted and talented students' language arts development after students partipicated in what the researchers labeled an "integrated curriculum model." Like Morrow, these researchers created an intervention—in this case a single unit called "Autobiographies: Personal Odysseys of Change"—and a control group for comparison purposes. Their goals included developing students' literary analysis and interpretive skills, persuasive writing skills, and linguistic competency. Participating schools were accepted if they could participate in the training (one to a few days) and provide a control group from the district. The study found that students in the experimental group outperformed those in the control groups in all three goal areas.

If we had more information, we might learn more from this research. Unfortunately, the unit was not described in terms of content, related activities, integrative lens, or planned length of participation. Researchers reported that some teachers made modifications (e.g., substituting literature if the packaged material was too difficult, dropping a research component for lack of time). However, changes were not discussed in terms of significance for unit integrity or relationship to unit goals. Unit effectiveness was judged in terms of traditional performance measures (e.g., describing the main idea of a literary selection, creating and justifying a title for a selection), not in terms of integrative abilities. One potentially integrative performance measure activity asked students to relate the concept of change to a selected literary passage. These problems make it challenging to know exactly what is integrative about this approach and how to interpret the findings that are favorable to students who participated in the researcher-developed unit. Studies

such as this one may provide traditional "rigor" in testing one group's performance against another, but without information about the intervention, such findings beg the possibility of meaningful interpretations.

While language was the central focus of the studies above, others (e.g., Baumann & Ivey, 1997; Block, 1993; Goatley, Brock, & Raphael, 1995) have studied intradisciplinary integration by teaching language processes through integrative activities centered on the literature itself. Baumann and Ivey's (1997) study is characteristic of such research. The authors describe their work as balancing literature study and skill/strategy instruction on the one hand, and balancing teacher-initiated and child-centered instruction on the other. Three kinds of activities—centered on the literature—were typical each day: (a) reading practice times, where students read connected text for 10–15 minutes; (b) strategy lessons focusing on word identification, vocabulary, comprehension, literature reading, and writing strategies; and (c) reading/language arts activities, from teacher read-alouds to students writing related to the literature they were reading on their own. Baumann, as teacher, emphasized integrating strategy and skill instruction within the context of literature reading, writing, and discussion, and creating opportunities elsewhere in the curriculum to extend this integration.

Baumann and Ivey measured students' progress in literacy learning and attitudes through teacher and student reflections, students' work samples, videotapes of classroom literacy activities, and assessments, including anecdotal records, grades and progress reports, and an informal reading inventory. The researchers conducted cross-case analyses to provide insights into the breadth of children's learning, and two case studies to provide insights into students' depth of learning. They identified five areas of students' learning. Children became readers, engaged with literacy, developed strategic approaches to word identification, demonstrated that they understood written texts, and learned to write about personal interests and experiences with a sense of audience.

These studies of intradisciplinary integration provide a small but encouraging base for the potential of integration to improve students' abilities to engage in literacy processes in meaningful ways and to do so within the context of reading, writing, and talking about literature and other resource materials. Initial studies point to the difficulties teachers face in creating such contexts and to the challenges of determining how these experiences affect students' literacy development.

Integrated Instruction: Interdisciplinarity and Curriculum Integration

According to curriculum scholars Goodlad and Su (1992, p. 330), an integrated curriculum "is intended to bring into close relationship such elements as concepts, skills, and values so that they are mutually reinforcing." Both empirical studies where disciplines are brought together to contribute to a common inquiry and studies where disciplinary boundaries are broken down in pursuit of a common problem are rare. Goodlad and Su suggest that such work may be more feasible in elementary schools, which lack constraints from separate curriculum specialists. However, school curriculum frameworks or standards establish such boundaries even when subjects are

taught by the same teacher. Jacobs (1989) cites two problems that plague curricula for interdisciplinary inquiry. The *potpourri problem* reflects lack of structures so that units become simply a sampling of knowledge from each discipline. The *polarity problem* underscores the territoriality that Goodlad and Su noted.

Where studies about interdisciplinary efforts do exist, they tend to preserve disciplinary boundaries. However, occasionally, an innovation will break down disciplinary boundaries (e.g., Bruner [1971] and colleagues' curriculum, *Man: A Course of Study*). The vast majority of "studies" of any type of interdisciplinary approach consisted of anecdotal cases written for practitioners promoting an integrated curriculum, usually where language and literacy processes are used in the practices associated with learning about school subjects (e.g., Casteel & Isom, 1994; Trepanier-Street, 1993). Further, the majority of these texts were simply "how-to" proposals, such as Fogarty's (1991) "Ten Ways to Integrate Curriculum" or descriptions such as Lapp and Flood's (1994) "Integrating the Curriculum: First Steps."

Interdisciplinary Research.

Research within this category centers on science, mathematics, and social studies. Interdisciplinary approaches centered on science tend to substitute literature and authentic resource materials (e.g., trade books, videotapes, laser disks, filmstrips, computers) for textbooks, and/or to make a conscious effort to teach domain-specific language arts skills and strategies within the context of learning a content area (e.g., Palincsar & Herrenkohl, in press; Romance & Vitale, 1992, cited in Bristor, 1994; Morrow et al., 1997).

Bristor (1994) described results from the first two years of a five-year study of science and language arts integration (see also, Romance & Vitale, 1992). Motivated by efficiency and a desire to make content area literacy instruction more meaningful, researchers designed a program in which they drew upon literacy research to build students' background knowledge prior to reading content texts. They linked relevant language arts curriculum objectives from their district guidelines to science activities. They drew on literature with science content from trade books and their basal reading program, and they engaged students in dramatic play related to the science themes. Based on subtests of standardized achievement texts, the researchers reported gains in the achievement in both reading and science for students in the integrated program as compared to those in traditionally separate curriculum. Further, based on a six-scale inventory of affect, students in the integrated program showed more positive attitudes and greater self-confidence than comparable students in the separate curriculum.

Morrow et al. (1997) had similar findings. Students were in one of three treatment groups: literature/science, literature only, and control. The two experimental groups involved a literature-based intervention using trade books in both literacy and science programs, or only in the literacy programs. Control classrooms used commercially published basal readers and textbooks. Students were tested before and after the year-long intervention, using informal and standardized tests to evaluate their growth in literacy skills and science content knowledge. On almost all measures—from story retellings to standardized tests—findings favor the integration of literature into science instruction.

Winograd and Higgins (1994-95), former classroom teachers, described their approach to integrating language process instruction within their mathematics curriculum through student-generated story problems. Through a series of vignettes, they detail the integration of mathematical reasoning, oral interactions through small group discussions, and process writing activities. Further, they detail how creating daily story problems led students to observe events outside the classroom as sources of story problems (e.g., one student interviewed his father about his job sanding streets after a snowfall). They suggest that such curriculum integration helps students move beyond surface features of a story problem to considering its meaning, and thus facilitates their ability to solve problems. Teachers invite students to write, and accompany that invitation with instruction in problem-writing and problem-solving skills and strategies.

Many researchers have examined interdisciplinary connections between social studies and literature or literacy. For example, Monson, Howe, & Greenlee (1989) surveyed middle-elementary students to find out the questions they had about their counterparts in other countries, then examined literature and textbooks for information that could address students' questions. They found that children's questions could be answered more deeply in trade books than textbooks, since trade books provided more depth in answering questions about the human condition than did comparable-age social studies books. Levstick's (1986, 1989, 1990) research with first-, fifth-, and sixth-grade students has demonstrated that literature can be motivating to history learning. Children across age levels were very interested in the human condition, and literature served as a way of entering its study so that it was possible for the youngsters to make connections to their own lived experiences.

Smith and his colleagues (1993; Smith, Monson, & Dobson, 1992) found that children remembered more and had better conceptual understanding when literature and social studies were integrated. Smith pre- and posttested students using an oral free recall measure to determine their knowledge of U.S. history. The intervention used trade books dealing with U.S. history to supplement students' social studies instruction. The free-recall measure revealed that students in the literature-social studies group recalled 60% more information about U.S. history than did control group students. Further, lack of difference on spring standardized scores indicated this advantage did not adversely affect performance in reading. Guzzetti, Kowalinski, and McGowan's (1992) comparison of sixth-grade students' learning about China through textbooks versus an integrated trade/textbook approach yielded similar findings.

While the studies above looked at how *literature* could be integrated with social studies, Beck and McKeown (1991; Beck, McKeown, Sandora, Kucan, & Worthy, 1996) examined how integrating *literacy instruction* with social studies impacted students' textbook comprehension. In a series of studies, they found that students' comprehension improved when they learned to consider the authors behind the textbooks, and to ask questions, metaphorically, of the author as they fill in gaps in their understanding.

Curriculum Integration.

In one of the few studies of curriculum integration, Sylvester (1994) documents teacher research he conducted with third graders as they created and participated in a classroom economy. Mathematics, literature, history, sci-

ence, and other school subjects came together as students considered the real issues in the community's day-to-day operations. Drawing on his fieldnotes and samples of students' work, Sylvester created three short case studies to illustrate the social and academic benefits students experienced. Students showed growth in self-esteem and motivation, interpersonal skills, sense of responsibility, and in "daydreaming new futures."

Sylvester suggests that, overall, students gained a great deal from the experience. First, he saw them engaged in meaningful exercises, working on daily applications of math problems, and engaging in literacy for real purposes. Second, students saw themselves in new roles—as entrepreneurs with businesses to run; as government leaders; and as citizens with a voice in and responsibilities to the community. Third, they maintained a strong racial identity without it conflicting with attempts for academic success. Fourth, they learned to deal with power (e.g., their teacher) in proactive ways. Fifth, they came to see "reality" as something to question and analyze, not simply accept as "the way it is." These assertions seemed consistent with the descriptions of the classroom community, the neighborhood, and students' participation within them. However, to understand the potential of such innovations for students' literacy development, it would be useful to include thicker descriptions of students' use of literacy across contexts, and related changes in their literacy abilities.

Integration In and Out of School

Integration in and out of school merges classroom life with contexts beyond a classroom's walls. Attempts involve integration across school, home, and community (e.g., Edwards, 1996; Moll, 1992a, 1992b). These innovations reflect a shift in focus from literacy as a set of skills to literacy as a set of cultural practices. In the former view, the job of school is simply to see that this set of skills is acquired by "organizing effective lessons...diagnosing skill strengths and deficits, providing appropriate exercises in developmentally felicitous sequences, motivating students to engage in these exercises, giving clear explanations and directions" (Resnick, 1990, p. 171). However, viewing literacy as a set of cultural practices underscores the importance of socializing students into the community or culture of literacy users (Moll, 1992a). Rethinking literacy in this way opens the door to connecting between students' cultural backgrounds and school experiences, the essence of integrating school literacy practices with those of home and community. A number of studies explored the meaning of such an approach for curriculum innovations and professional development.

Home-School Connections.

At one level, teachers create opportunities for students to share school language and literacy activities with their families (e.g., Morrow, 1992), or draw on families to share home literacies and events in school (e.g., Edwards, 1996; Damkoehler, Gayle-Evans, Farrell-Stroyan, & Lockhart, 1996). Edwards (1996) provides one example of such home-school connections in her study of sharing time in two kindergarten classrooms, based on concerns about the discontinuity some children experience between home and school language patterns. While Michaels (1981) attributed such discontinuity to students' ethnic backgrounds, teachers working with Edwards observed that

"white children as well as black children failed to employ a topic-centered style during sharing time" (1996, p. 345). If students experience a discontinuity between home and school literacy practices, they lose opportunities to understand literacy as part of their cultural practices and connect from their lives to the work of school. The researchers thought students' difficulties may be helped by involving their families in decisions about what to share in school and practicing how to share it. Their approach was designed to make school language explicit and to provide a context for students to practice oral presentation, a major part of the kindergarten curriculum through sharing time. Parents received guidance to help their children prepare for upcoming presentations. Teachers and researchers kept records of individual students' growth in oral language facility. As a result of participating in this daily activity, teachers believed their students became better listeners, developed an understanding of topic-centered presentation, and developed greater self-esteem. Fieldnotes describing one child's progress trace his evolution from a shy child who typically mumbled so severely that he was inarticulate, to one who maintained eye contact with his peers, used complex sentences, and paused for questions which he capably answered.

Similar attempts to connect to family stories have been made in later grades through studies of family histories (see, for example, Damkoehler et al., 1996), though to date little formal research has been conducted to indicate specific consequences for students' literacy learning. Within such studies, integration of oral and written language was important, but the integration of the child's home and school language experiences, and their developing understandings of themselves as cultural beings. were equally crucial. Such experiences may serve as an important basis for students to later actually study the language, literacy, and culture in their homes and in the communities in which they live. (Pearson, 1994 defines this as "integration into the community.")

School-Community Integration.

In "integration into the community" studies, integration occurs in two ways. First, language and literacy skills are applied as students gather information. In doing so, they have authentic reasons to engage in literate activity, and, we assume, are motivated because the subject of study is connected to their lives. Second, language and literacy skills are themselves the object of study, as students look across contexts to explore how language and literacy are used in different contexts, some of which may be unfamiliar.

Two well-known scholars in this area are Luis Moll and Shirley Brice Heath. In the 1970s, Heath conducted ethnographic research in North Carolina's Piedmont area, studying students and their families from three different cultural communities (1982). She later applied what she had learned to collaborative work with teacher-researchers (1983). She describes a third-grade classroom with integrated written and oral language activities, as well as school activities integrated with students' home and community experiences. For example, speakers from the community were interviewed in the classroom. Students viewed themselves as "language detectives" uncovering differences in language use among working contexts: a grocer uses a lot of "politeness" terms and essentially asks "yes-no" questions, while guides from the nature museum talk in long paragraphs. Students also analyzed talk in their homes, beginning by recording the types of questions they hear asked, and later interviewing their parents about the types of reading, writing, and talking they engage in at their jobs. Heath notes that by the end of the year,

most students in this class were above grade level on reading tests, able to write stories, and create paragraphs related to their content area study.

More recently, Moll (1992a, 1992b; Moll & Gonzáles, 1994; Moll, Vélez-Ibáñez, & Greenberg, 1989), working collaboratively with teachers, has been exploring "how literacy takes place in the broader social contexts of households and community life [in an] attempt to understand and forge relationships between these domains of study" (1992b, p. 211). One aspect of this work has involved identifying the funds of knowledge in the community, then drawing on these funds to contribute in substantive ways to the classroom's intellectual life. This integration of classroom and community has played out in several classroom-based projects. To date, Moll and his colleagues have concentrated analyses on the impact of such approaches on teachers' professional development. Moll studied the curriculum practices teachers initiated, their understanding of literacy as cultural practice, and homes as important sites for literacy engagement and use for a wide range of purposes.

Moll illustrates how the interweavings of professional development initiatives in the form of a teacher study group and an after school laboratory support students' literacy development (Moll, Vélez-Ibáñez & Greenberg, 1989) and contributed to teachers rethinking their literacy curriculum. For example, Ina A. created an interdisciplinary unit around the topic of construction, knowing that there were substantial resources she could draw on within the community, including parents of students in her class and other, unrelated adults. Students engaged in traditional forms of information gathering that invited practice of literacy skills, such as library research, creating models, and writing related essays in either Spanish or English, so they could emphasize their ideas without constraint. Community members in their study were invited to present to the classroom. Literacy routines in the classroom included research, oral presentations, and written presentations.

Teachers who participated with Ina A. have described what Moll and Gonzáles call the "transformative potential of viewing households from a funds of knowledge perspective" (1994, p. 444). First, like teachers participating in Edwards's (1996) study, they reported realizing as myth the notion that working-class parents of language minority students lacked experiences and knowledge to contribute to their students' literacy development. Second, they developed sophisticated notions of culture, moving from thinking of culture as a collection of personality traits, folk celebrations, and so forth to seeing culture as a collection of lived practices and knowledge (Moll, Amanti, Neff, & González, 1992).

One of the findings of Moll's line of research is the importance of teachers' own experiential learning. They developed their understanding of funds of knowledge and transformed their classrooms as a result. Other efforts have explored paths from professional development to transforming curriculum. Tchudi and Lafer (1993) felt that among the challenges teachers face in teaching within integrated approaches is that they themselves have no experience in such methods. The researchers created a summer institute in which teachers could experience an interdisciplinary curriculum, grounded in the study of their local community's scientific, economic, literary, and cultural heritage. They describe their work as existing within a language arts perspective of "reading and writing the culture" (p. 78), where participants read poetry, nonfiction, and fiction about the region; maintained journals;

wrote imaginative texts across the curriculum drawing on their experiences studying the Truckee River of Nevada; met with local writers in workshops; and participated in a "chautauqua," a 19th century tradition for a cultural exposition and tent show, including reenactments and lectures highlighting historical figures and events.

In their anecdotal report, the researchers traced the impact of participants first-hand experience in an interdisciplinary approach on their subsequent site-based curriculum development. Tchudi and Lafer describe four teachers who had substantial influence in changing their elementary school curriculum to an integrated approach developing a year-long theme of "communities." Their work in the elementary school eventually led to presentations at a regional conference and the publication of their curriculum by one of the state's professional organizations. Other participants revealed impact through revisions to courses they taught, implementation of new units, and providing support for other professionals in their teaching sites (e.g., compiling a bibliography on the desert/Nevada/water for young readers).

Challenges to Integration In and Out of School.

Goodlad and Su (1992) suggest what may be obvious from the lines of research described above: teaching from an integrated perspective or creating an integrated curriculum is challenging, which helps us understand why, as Walmsley and Walp (1990) found, it is such a long-term process. Schmidt and his colleagues (1985) found that despite teachers' favoring integration and their belief that it is more efficient, integrated instruction of any kind (within the language arts and across disciplines) accounted for less than 10% of their instructional time during the academic year in which the study took place. Why do so few teachers move in this direction? Some researchers have documented specific challenges that inhibit integrated instruction. Both Pappas and Oyler (1993) and Roskos and Neuman (1995) created case studies of teachers as they began planning and implementing integrated language arts units.

Pappas and Oyler (1993) present case studies of two teachers as they began the process of integration. Their focus was initially intradisciplinary, but moved gradually toward cross-content area studies. Michael—a first-year, fifth-grade teacher—had established several features in his classroom characteristic of others studying integrated instruction. He had developed cross-disciplinary thematic units, integrating literacy instruction with science and social studies. He supplemented or replaced traditional textbook-driven curriculum using materials with more potential to support integrative inquiry. For example, he received a grant to buy animals and informational books to support students' inquiry about the animals. He implemented alternative social structures in the classroom that gave students voice and some control over their learning, such as initiating literature response groups as part of the literacy program.

At the beginning of the following year, Michael discussed some of his goals. His comments suggest that such surface level changes are not sufficient to ensure integration. Being a first-year teacher, he realized that he needed to increase his knowledge base of both content and instructional delivery processes. He set as a goal to transition from just "bringing books" to providing processes and support for students to make connections between the availability of new textual materials and engaging in language processes for the purposes of inquiry. Pappas and her colleagues suggest that changes in

teaching practices involve more than simply "taking on new methods or techniques. At the root of their innovations is a different theory about knowledge and language" (1993, p. 301). Further, as Lipson et al. (1993) note, "this type of teaching requires a different view of the language arts within different organizational structures" (p. 254). In short, becoming effective integrative teachers requires fundamental changes in teachers' epistemological beliefs and the day-to-day practices of structuring their classroom.

In studying teacher planning, Roskos and Neuman (1995) provide insights into how fundamental changes in beliefs and practices play out in teachers' integrated unit planning, and in so doing, shed light on the demands such approaches place on teachers. They studied two kindergarten teachers as they planned topic-based units where students used language and literacy as tools for learning. Challenges to unit planning stemmed from two sources. First, there were multiple levels of planning, far more complex than they had experienced in more traditional lesson planning: metaplanning (i.e., planning the plan), topic and content planning, activity planning, environmental planning, and revision planning. Second, these layers of planning created demands on teachers' time, specificity of planning, knowledge, and level of work. There were greater demands for what Shulman (1986) terms *pedagogical content knowledge*. This type of knowledge requires that teachers be able to understand and interpret the subject matter that they plan to include, find ways to represent this knowledge for their students, and adapt it to their students' levels and their own classrooms. The teachers studied by Roskos and Neuman found that they were not simply adding new techniques; they were fundamentally changing the way they looked at their instruction.

One might wonder if teachers who do not have support for participating in experiential opportunities or mutual planning time can turn to commercially available materials to support their own integration attempts within their classrooms. A study of professional materials—teacher education texts, commercial reading and language arts programs—reveals discouraging information (Lipson et al., 1993). Researchers found that while the philosophy and rationale for integration may be clear from these resource materials, the discussion of how to effectively create and implement integrated units falls short of expectations. Similar findings emerged in their analysis of basal reading and supplementary materials from the early 1990s. While superior to earlier editions, the series often lacked the focus and coherence needed to promote thematic learning. Supplementary materials were often collections of activities that led more to fragmentation than integration around coherent concepts.

Summary: Promises and Cautions.

Integrated instruction is hard work that involves crossing boundaries of the curriculum and the classroom/school, intensive planning, and well-developed knowledge. Moreover, it requires a theoretical framework to guide both curriculum construction and innovations in instruction. Without such a theory, there are risks. Social studies educators Alleman and Brophy (1993; 1994) recommend that educators "consider integration a potential tool that is feasible and desirable in some situations but not in all" (p. 66), since so many current recommendations for integrated practices lack any conceptual base. In their analysis of how integration played out in a social studies series, they noted activities irrelevant to learning social studies (e.g., using social

studies content to focus on pluralizing nouns) or so time-consuming as to be questionable (e.g., artistic or construction work). Some activities distort social studies content (e.g., five steps to building a log cabin). Pearson, a literacy educator, sees similar problems from a literary perspective. "My fear is that if we view literature as a basis for contextualizing or applying specific language activities or strategies, we may end up doing violence to the very literature we selected so that these activities would be 'relevant and authentic'" (Pearson, 1994, p. 25).

More can be done to ease constraints that mitigate against teachers' innovations. More can be done to create meaningful opportunities for teachers to experience such learning firsthand. More can be made available in terms of professional resources. Certainly, more is needed in terms of both a theoretical and a research base as we consider not when or how to integrate the curriculum, but whether, for what purposes, and for whom?

A Theoretical Critique: Integrated Instruction Understood Transactively

As editor of the National Society for the Study of Education yearbook devoted to integration, Dressel (1958a, 1958b) characterized it as "truly the central problem of education." Given this importance, we were surprised that among the many articles about integrated approaches, with few exceptions, there was little attempt to address integration theoretically. There were references to important theoretical lenses, but a theory conceptualizing the whats, whys and hows of integration was seldom in evidence. Typically, proponents emphasized authenticity, motivational value, and efficiency which, while important, provide little rationale for thoughtful integration. What makes integration educative? And why?

Integration is multifaceted, referring to many distinct but related constructs. With no theoretical lens to guide research, policy, and practice, it is impossible to determine the relationship among these different facets of integration. Research questions to date may be too narrow, focused on whether or not integration is effective for organizing curricula. Instead of asking *whether* to integrate, we need a principled, contextual conception of integration to guide us in addressing *what to integrate with what, why, when, how,* and *for whom.*

In concluding our review, we briefly describe a transactional conception of integration, supported by recent developments in evolutionary biology (Levins & Lewontin, 1985; Maturana & Varela, 1980), neurophysiology (Varela, Thompson, & Rosch, 1991) and cognitive science (Winograd & Flores, 1986), as well as philosophy, psychology, and education (Dewey, 1896; Vygotsky, 1997). We stress two tenets derived from a transactional perspective: (a) the constitutive role of embodied language practices in mediating the relationship between individuals and their environment; and (b) the importance of understanding both the developmental history of learners and the cultural history of what they are to learn. We close with some ways

in which a transactive conception of integration can lead to developing students' understanding of a critical disciplinarity.

A Transactional Conception of Knowing

Most work on integration seems predicated on an underlying dualism in which the individual and the environment are assumed to exist independent of each other. Arguing for a transactional conception of mind, Johnson (1987) suggests that this dualism leads to our asking how the two are related, and which is responsible for the structure of the world. Idealist perspectives emphasize the contribution of the individual, while objectivist perspectives emphasize the contribution of the environment. Johnson (p. 207) maintains that "it is a mistake to think of an organism and its environment as ... independent and unrelated entities; the organism does not exist ... apart from its environment." Contrary to idealism, individuals do not simply construct reality according to subjective desires and whims. Contrary to objectivism, individuals are not merely mirrors of nature that determine concepts in one and only one way. This dualism can result in *naive constructivism* in which individuals are assumed to be free to draw relationships wherever they "see" them; or a *naive realism* in which integration is judged against an individual's ability to accurately relate objects and events as they are assumed to exist objectively in the world. Instead, Johnson argues for a *transactional perspective of mind* such that

> our structured experience is an organism-environment interaction in which both poles are altered and transformed through an ongoing historical process. In other words the environment is structured in ways that limit the possibilities for our categorizations of it. But the structure of the environment by no means strictly determines the structure of our experience, which is to say, our understanding of our world. (Johnson, 1987, p. 207)

Thus, the locus of integrated knowledge is found in neither the eyes of the beholder nor the object beheld, but in the transactions between the two. When we speak of "experience," we mean our history, culture, language, institutions, etc., not simply a set of mental representations of a static, already organized reality. Central to understanding the nature of these person-environment transactions is the role of embodied language practices.

The Constitutive Role of Embodied Language Practices

The belief that language represents or corresponds to an independently existing reality is deeply ingrained in our folk psychology and pedagogy. The role of language is often assumed to be transparent, merely a vehicle through which the already organized world is named and described. However, from a transactional perspective, "language (is) a means for social coordination and adaptation.... Describing how things are (is shorthand for) finding descriptions of reality that work more or less well given our purposes in framing descriptions of reality" (Johnson, 1987, p. 211).

Two implications follow when language is understood transactively. First, language helps us shape our knowledge—our "reality." Rather than mirroring what is in the world, language practices are constitutive of what we come to know. For language to realize this constitutive function, it must occur within the contexts of joint social activity where determinate meanings and their relationships are formed (e.g., literature discussions, project-based activities in subject areas).

Integration, the process by which we come to know what goes with what, is a normative practice. It is discursive, but also grounded in practice. Language doesn't simply name already existing integrative relationships; it is constitutive in bringing these relationships into being. However, not anything goes; rather, established integrative relationships are based upon a history of embodied social practices with a material and ideal world.

Many of the arguments for integration stem from notions of increased authenticity. This view of language offers a warrant for such a position. It argues for the kind of socially-based activities within topics and themes characteristic of integrated instruction. Thus, teachers collaborating with Moll (1992a) used ethnographic techniques to describe how things were among students' households, and found that in doing so, they challenged the "reality" they had earlier created about the families' attitudes and resources. Students in Winograd and Higgins's (1994-95) study reconstructed their understandings of mathematical reasoning through the story problems they composed.

A second implication of a transactive conception of language follows from the first. Because language is not to be understood in terms of accuracy in representing or corresponding to an independently existing world, it is fundamentally underdetermined in its capacity for constructing, integrating, and communicating meanings. This is particularly problematic in schooling, where one goal is to convey society's common knowledge (Edwards & Mercer, 1987). This underscores the importance of creating discourse-based-communities of practice (Brown, 1994; Swales, 1990; Wenger, 1998) that share a common lexicon, mechanisms for communication, and a critical mass of participants. Thus, a further warrant for integrated instruction, supported by a transactional perspective, is that such approaches build communities for engaging in embodied language practices as phenomena are explored. For example, Sylvester and his students tackled elusive concepts related to economics, government, and human rights. They did so using language that had shared meaning within the community. Rather than simply *talking* about these constructs, the students within this community *practiced* them.

The Developmental History of the Knower and Cultural History of the Known

We have seen that objects and events may be combined into larger wholes—they may be integrated—because individuals with particular developmental histories transact with school subjects with particular cultural histories. What goes with what is a function of the ongoing history of transaction between persons and their environment. Thus, a second insight of a transactive perspective concerns the importance of a joint emphasis on teachers'

understanding the cultural history of that which is to be learned (e.g., disciplinary knowledge) and the developmental history of their students. It is only through genetic analyses of both knower and known that we can fully understand their present ongoing transactions. If teachers are to integrate the curriculum in a manner that their students are able to understand, they must coordinate their pedagogical transactions with these students in ways that are developmentally sensitive.

> The adult mind is so familiar with the notion of logically ordered facts that it does not recognize—it cannot realize—the amount of separating and reformulating which the facts of direct experience have to undergo before they can appear as a "study," or branch of learning. (Dewey, 1902, p. 6)

The challenge of understanding and implementing integrated instruction from a transactive perspective thus requires that we simultaneously keep both the developing knower and known in our conceptual field of vision. Fostering the development of children in a changing world thus becomes the allegorical equivalent of building a ship while at sea. We must assist them in coming to understand the normative integrative meanings (e.g., subject matter knowledge) that have been culturally constructed, while at the same time understanding their origins in embodied discursive practices—practices that are likely to lead to newly integrated meanings. Such "binocular vision" is necessary if we are to foster their development of what we call a "critical disciplinarity."

Fostering Students' Critical Disciplinarity

We believe that a critical disciplinarity rests upon a critical literacy. Any conception of child development must recognize the central role of language in the development of mind and the development of the disciplines. Halliday (1993) suggests that "the distinctive characteristic of human learning is that it is a process of making meaning ... (T)he ontogenesis of language is at the same time the ontogenesis of learning." The challenge of fostering students' development of a critical disciplinarity involves the two-pronged task of assisting them in coming to understand the systematized meanings associated with disciplinary knowledge, while simultaneously encouraging an historical consciousness that reveals the constructed, discursive nature of such knowledge.

"Language is not a *domain* of human knowledge; language is the essential condition of knowing, the process by which experience *becomes* knowledge" (Halliday, 1993, p. 94). Several individuals have emphasized the developmental and epistemological primacy of narrative genres in the development of both the knower and the known. Scholes, a literary theorist, characterizes narrative as "a major armature of thought" (1989, p. 4). Nelson (1996, p. 184) suggests that "narrative is the 'natural product' of language; it precedes and is the source of theoretical thinking." She maintains that "human cognition is basically formulated in terms of stories, and logic, classification, and rational inference are all in some sense derivative from storytelling." Similarly, Bruner (1996, p. 121) suggests that "it is very likely the case that the most natural and earliest way in which we organize our experi-

ence and knowledge is in terms of narrative form...that the beginnings, the transitions, and the full grasp of ideas in the spiral curriculum depend upon embodying those ideas into a story or narrative form."

For example, the pedagogical use of well-chosen narrative histories of conceptual change across multiple school subjects has the potential to teach children not only about the disciplines, but the idea of (inter)disciplinarity itself—the discursive processes by which the disciplines are constructed, maintained, and permeated by other disciplines. Over and above their literary value, the principled integritive use of various narrative genres in elementary education has the ironic potential of leading to a deeper, more critical understanding of subject-matter knowledge. One can imagine developmentally informed integrated literacy instruction which in the early elementary grades forefronts the storied, discursive nature of knowing, but in later elementary grades comes increasingly to emphasize the disciplined, systematic nature of organizing and understanding school subjects.

Concluding Statement

Integrated literacy instruction turned out to be a far more elusive and far more complex area than we had ever anticipated. In the process of this review, we found ourselves surprised at the small ratio of data-driven articles to overall papers on the subject, and wondered if the push toward integration of any kind might be premature, or even ill-founded. We became increasingly convinced, however, by the albeit small number of studies, that integrative approaches are exciting ways of rethinking school curriculum within and beyond the language arts. Future research is required to provide the needed base for promoting integrated innovations. But we need more than just research—we need research driven by a strong conceptual framework that helps us unpack the construct, consider its potential advantages, and find ways to address the very real challenges and drawbacks we cannot ignore.

Notes

1. In our review, we distinguish our analyses of the construct of integration from analyses detailing specific relationships between the language arts. Excellent reviews of such relationships exist elsewhere (e.g., listening and reading reviewed by Sticht & James, 1984; Sinatra, 1990; writing and reading by Langer & Allington, 1992; Shanahan & Lomax, 1988; Spivey & Calfee, 1998; Tierney & Shanahan, 1991).

2. Integrated language arts has also been one of the primary tenets of whole language approaches, though the two are not synonymous. In this review, we deliberately chose not to conflate the two terms. For a treatment of

instructional research on whole language, see Raphael and Brock (1997). For the history of whole language, see Goodman (1989).

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About CIERA

The Center for the Improvement of Early Reading Achievement (CIERA) is the national center for research on early reading and represents a consortium of educators in five universities (University of Michigan, University of Virginia, and Michigan State University with University of Southern California and University of Minnesota); teacher educators, teachers, publishers of texts, tests, and technology, professional organizations, and schools and school districts across the United States. CIERA is supported under the Educational Research and Development Centers Program, PR/Award Number R305R70004, as administered by the Office of Educational Research and Improvement, U.S. Department of Education.

Mission. CIERA's mission is to improve the reading achievement of America's children by generating and disseminating theoretical, empirical, and practical solutions to persistent problems in the learning and teaching of beginning reading.

CIERA Research Model

The model that underlies CIERA's efforts acknowledges many influences on children's reading acquisition. The multiple influences on children's early reading acquisition can be represented in three successive layers, each yielding an area of inquiry of the CIERA scope of work. These three areas of inquiry each present a set of persistent problems in the learning and teaching of beginning reading:

CIERA INQUIRY 1
Readers and Texts

Characteristics of readers and texts and their relationship to early reading achievement. What are the characteristics of readers and texts that have the greatest influence on early success in reading? How can children's existing knowledge and classroom environments enhance the factors that make for success?

CIERA INQUIRY 2
Home and School

Home and school effects on early reading achievment. How do the contexts of homes, communities, classrooms, and schools support high levels of reading achievement among primary-level children? How can these contexts be enhanced to ensure high levels of reading achievement for all children?

CIERA INQUIRY 3
Policy and Profession

Policy and professional effects on early reading achievement. How can new teachers be initiated into the profession and experienced teachers be provided with the knowledge and dispositions to teach young children to read well? How do policies at all levels support or detract from providing all children with access to high levels of reading instruction?

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CIERA
Center for the Improvement of Early Reading Achievement

CIERA is a collaboration of
University of Michigan
University of Virginia
Michigan State University
with
University of Minnesota
University of Southern California

University of Michigan School of Education
610 E University Av, Rm 1600 SEB
Ann Arbor, MI 48109-1259
734.647.6940 voice
734.763.1229 fax
ciera@umich.edu

www.ciera.org

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